office hours this week

- Wednesday, 12-1:30pm
  in room CSB230

- Tuesday / Thursday, by appointment

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cochlear amplification

- Outer hair cells contract and exert force on the basilar membrane
  - prestin is a protein present in their membrane that allows them to contract
  - this action generates a positive feedback mechanism
  - This action **amplifies** the vibration of the membrane
auditory pathways

Figure 12.12 Diagram of the major auditory pathways. Although many details are missing from this diagram, two important points are evident: (1) the auditory system consists of several parallel pathways, and (2) information from each ear reaches both sides of the system, even at the level of the brainstem.
MGN cells respond to specific frequencies and to complex sounds.

Information goes to SUPERIOR COLLICULUS to integrate auditory and visual information.
Encoding information about stimulus intensity

- Firing rates of neurons
- Number of active neurons

Membrane potential of activated hair cells more depolarized or hyperpolarized

Loudness perceived is correlated with number of active neurons.

ENCODING SOUND INTENSITY
• Along the auditory pathway, many neurons are sensitive to stimulus frequency
• They are most sensitive to their characteristic frequency.
Tonotopy

One type of nontonotopy
Sleep Waves

EEG RECORDINGS DURING SLEEP

Awake

Stage 1
NREM Alpha

Stage 2
NREM Theta
(sleep spindles; K-complexes)

Stage 3
NREM Delta

REM

Time (seconds)